Leidy, Robert

From: Ian Murray <Ian.Murray@pima.gov>
Sent: Thursday, October 01, 2015 3:51 PM
To: Leidy, Robert
Cc: Brian Powell; Goldmann, Elizabeth
Subject: RE: Cienega creek temperature data clarification

Hi Rob,

I see, and thank you for the extra clarification. I will compare what water temperature data we do have with the base flow data.

Cheers,
Ian

From: Leidy, Robert [mailto:Leidy.Robert@epa.gov]
Sent: Thursday, October 01, 2015 3:09 PM
To: Ian Murray
Cc: Brian Powell; Goldmann, Elizabeth
Subject: RE: Cienega creek temperature data clarification

Hello Ian,

Thank you for following up on my question. Let me try to clarify what I am asking: Other studies have noted that as stream baseflow decreases (which Pima County has clearly demonstrated is the trend for lower Cienega Creek), thermal sensitivity increases. That is, the ability of baseflow to buffer increases in water temperatures decreases. If we have a trend of declining baseflow and projected drought and temperature increases from climate change, then one would expect thermal sensitivity to increase (less buffering capacity). I am wondering if there is any way to correlate the measured temperatures over the years from lower Cienega Creek (or elsewhere in the OAW) with declining baseflow. Any human-caused increase in surface/groundwater would also result in a decrease in baseflow that might significantly add to on-going changes.

Please let me know if this has helped to clarify my question.

Best,

Rob

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From: Ian Murray [mailto:Ian.Murray@pima.gov]
Sent: Thursday, October 01, 2015 10:46 AM
To: Leidy, Robert
Cc: Brian Powell
Subject: Cienega creek temperature data clarification

Hi Rob,

I'm a new biologist working with Brian Powell, and I would like to attempt to answer your questions and provide the information that you are seeking. However, just to clarify, are you specifically wondering about the relationship between measured stream baseflow and the actual water temperature in Cienega Creek (or other streams if the data are available), or are you asking about the relationship between thermal sensitivity (e.g., critical thermal maximum temperatures for the fish species of interest) and stream baseflow? I'm not sure we have actually measured the critical thermal minima or maxima for the fish of interest, but we have a library of information where there could be information of this nature and which I can sift through. I've pasted your question below:

"This is helpful. I am also curious if you have any information on the relationship between declining baseflow and thermal sensitivity for either the Cienega Basin or other streams in AZ. We have water temperature data for Marsh Station and I am wondering how this data might or might not be useful in the context of PIMA's hydrology/species report and findings, especially in terms of the potential of mine-related changes in water quality."

Thank you,
Ian